



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/713,842	11/14/2003	Michael Goldstein	10559-783002	9207
20985	7590	03/31/2006		
FISH & RICHARDSON, PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			EXAMINER AMARI, ALESSANDRO V	
			ART UNIT 2872	PAPER NUMBER

DATE MAILED: 03/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/713,842

Applicant(s)

GOLDSTEIN, MICHAEL

Examiner

Alessandro V. Amari

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-17 and 21-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8-15 and 21-27 is/are rejected.
- 7) ☒ Claim(s) 16 and 17 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>10/15/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States;

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 8, 13-15 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Wolter US 2,759,106.

In regard to claim 8, Wolter teaches (see Figures 1, 3) an apparatus comprising a first reflective surface (E) to reflect light rays emanating from a point (F), the first reflective surface having a curvature such that substantially all of the reflected light rays propagate at a first angle relative to an axis that passes through the point and converge towards a region to produce uniform illumination at the region as shown in Figures 1a and 3a and as described in column 2, lines 26-38.

In regard to claim 13, Wolter teaches (see Figures 1a, 3a) an apparatus comprising a reflective surface (E) positioned relative to an optical axis to reflect light rays emanating from a location on the optical axis (F) so that the light rays converge towards a region on a plane perpendicular to the optical axis, the reflective surface having a curve segment that comprises a section of a parabolic curve having a focal

Art Unit: 2872

point at the location and rotated an angle relative to the optical axis as described in column 2, lines 26-38.

Regarding claim 14, Wolter teaches that the reflective surface comprises the surface swept by sweeping the curve segment about the optical axis as shown in Figures 1a and 3a and as described in column 2, lines 26-38.

Regarding claim 15, Wolter teaches that the rotation angle of the parabolic curve equals the angle between the optical axis and a propagation direction of light rays reflected by the reflective surface as shown in Figures 1a and 3a and as described in column 2, lines 26-38. While the prior art does not specifically teach the claimed angle, this is seen as an inherent teaching of the device since the parabolic curve must equal this angle in order for the device to operate as intended.

In regard to claim 21, Wolter teaches (see Figures 1a, 3a) a method comprising generating light rays from a location (F) on an optical axis; reflecting the light rays with a first reflective surface (E) having a curvature such that substantially all of the reflected light rays propagate with a first convergence angle relative to the optical axis, the light rays converging toward a region to produce uniform illumination at the region as shown in Figures 1a and 3a and as described in column 2, lines 26-38.

3. Claims 8, 11-15 and 21-26 are rejected under 35 U.S.C. 102(e) as being anticipated by Vasylyev et al US 6,620,995.

In regard to claim 8, Vasylyev et al teaches (see Figures 1, 5, 6) an apparatus comprising a first reflective surface (18) to reflect light rays emanating from a point, the first reflective surface having a curvature such that substantially all of the reflected light

rays propagate at a first angle relative to an axis (24) that passes through the point and converge towards a region to produce uniform illumination at the region as shown in Figures 1 and 5 and as described in column 3, lines 51-67 and column 4, lines 1-24.

Regarding claim 11, Vasylyev et al teaches (see Figures 1, 5, 6) further comprising a second reflective surface (any of the other nested reflective surfaces 18) to reflect light rays emanating from the point, the second reflective surface having a curvature such that the reflected light rays propagate at a second angle with the optical axis, the reflected light rays forming an annular wave front that converges towards the region as shown in Figures 1 and 5 and as described in column 3, lines 51-67 and column 4, lines 1-24.

Regarding claim 12, Vasylyev et al teaches that the second angle is different from the first angle as shown in Figures 1 and 5.

In regard to claim 13, Vasylyev et al teaches (see Figures 1, 5, 6) an apparatus comprising a reflective surface (18) positioned relative to an optical axis to reflect light rays emanating from a location on the optical axis (24) so that the light rays converge towards a region on a plane perpendicular to the optical axis, the reflective surface having a curve segment that comprises a section of a parabolic curve having a focal point at the location and rotated an angle relative to the optical axis as described in column 3, lines 51-67 and column 4, lines 1-24.

Regarding claim 14, Vasylyev et al teaches that the reflective surface comprises the surface swept by sweeping the curve segment about the optical axis as shown in Figures 1 and 2 and as described in column 3, lines 51-67 and column 4, lines 1-24.

Regarding claim 15, Vasylyev et al teaches that the rotation angle of the parabolic curve equals the angle between the optical axis and a propagation direction of light rays reflected by the reflective surface as shown in Figures 1 and 2 and as described in column 3, lines 51-67 and column 4, lines 1-24. While the prior art does not specifically teach the claimed angle, this is seen as an inherent teaching of the device since the parabolic curve must equal this angle in order for the device to operate as intended.

In regard to claim 21, Vasylyev et al teaches (see Figures 1, 2, 5, 6) a method comprising generating light rays from a location on an optical axis (24); reflecting the light rays with a first reflective surface (18) having a curvature such that substantially all of the reflected light rays propagate with a first convergence angle relative to the optical axis, the light rays converging toward a region to produce uniform illumination at the region as shown in Figures 1, 5 and 6 and as described in column 3, lines 51-67 and column 4, lines 1-24 .

Regarding claim 22, Vasylyev et al teaches (see Figures 1, 2, 5, 6) that the light rays with a second reflective surface (18) having a curvature such that substantially all of the light rays reflected from the second reflective surface propagate with a second convergence angle relative to the optical axis, the light rays converging toward the region as shown in Figures 1, 5, and 6 and as described in column 3, lines 51-67 and column 4, lines 1-24.

Regarding claim 23, Vasylyev et al teaches that the second angle is different from the first angle as shown in Figures 1, 5 and 6.

In regard to claim 24, Vasylyev et al teaches (see Figures 1, 2, 5, 6) a method comprising providing a first reflective surface (18) to reflect light rays emanating from a location, the first reflective surface having a curvature such that reflected light rays propagate in a direction at a first angle with an axis and converge toward a region to produce uniform illumination at the region as shown in Figures 1, 5 and 6, and providing a second reflective surface (18) to reflect light rays emanating from the location, the second reflective surface having a curvature such that reflected light rays propagate in a direction at a second angle with the axis and converge toward the region, the second angle different from the first angle as can in seen in Figures 1, 5 and 6 and as described in column 3, lines 51-67 and column 4, lines 1-24.

Regarding claim 25, Vasylyev et al teaches (see Figure 1) that the first reflective surface (one of the reflective surfaces 18 closest to the spot 20) and the second reflective surface (one of the reflective surfaces closer to the source) are concentric to the axis and the first reflective surface is closer to the location than the second reflective surface as shown in Figure 1.

Regarding claim 26, Vasylyev et al teaches further comprising adjusting the relative positions of the first and second reflective surfaces so that when light rays are reflected by the first reflective surface, the reflected light rays are not blocked by the second reflective surface as described in column 7, lines 57-65.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2872

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over

Vasylyev et al US 6,620,995 in view of Marks US 4,841,946.

Regarding claim 10, Vasylyev et al teaches the invention as set forth above but does not teach that the reflective surface comprises multilayer coatings.

Regarding claim 10, Marks teaches that the reflective surface comprises multilayer coatings as described in column 5, lines 23-34.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the multilayer coatings of Marks in the apparatus of Vasylyev in order to provide for increased reflectivity in order to improve the performance and response of the receiver for a particular frequency range.

6. Claims 9 and 10 rejected under 35 U.S.C. 103(a) as being unpatentable over Wolter US 2,759,106 in view of Takahashi US 6,172,825.

Regarding claims 9 and 10, Wolter teaches the invention as set forth above but does not teach in regard to claim 9, that the reflective surface comprises a ruthenium layer or in regard to claim 10, that the reflective surface comprises multilayer coatings.

Regarding claims 9 and 10, Takahashi teaches that the reflective surface comprises a ruthenium layer or comprises multilayer coatings as described in column 8, lines 21-25.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a ruthenium layer or multilayer coatings of Takahashi in

Art Unit: 2872

the apparatus of Wolter in order to properly reflect light in the ultraviolet spectrum for applications of interest in that frequency range.

7. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vasylyev et al US 6,620,995.

Regarding claim 27, Vasylyev et al teaches the invention as set forth above but does not teach further comprising treating the surface of the first and second reflective surfaces to enhance reflectivity of light having a wavelength less than 300nm. It is well known in the radiant energy art to have reflective surfaces keyed to reflect certain wavelengths. It would have been obvious to one having ordinary skill in the art at the time the invention was made to treat the surface of the first and second reflective surfaces to enhance reflectivity of light having a wavelength less than 300nm in order to properly reflect and focus light in the ultraviolet spectrum for application of interest in that frequency range.

Allowable Subject Matter

8. Claims 16 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. Claim 16 is allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest, the rotated parabolic curve represented by the claimed equation as set forth in the claimed combination.

Claim 17 is allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest, the rotated parabolic curve represented by a truncated expansion of the claimed equation as set forth in the claimed combination.

The prior art of record teaches an apparatus comprising a reflective surface positioned relative to an optical axis to reflect light rays emanating from a location on the optical axis so that the light rays converge towards a region on a plane perpendicular to the optical axis, the reflective surface having a curve segment that comprises a section of a parabolic curve having a focal point at the location and rotated an angle relative to the optical axis. However, the prior art does not teach that the rotated parabolic curve is represented by the recited equations and there is no motivation or teaching to modify this difference as derived.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ogawa et al JP6-130301 teaches (see Figure 2) an apparatus comprising a first reflective surface (21) to reflect light rays emanating from a point (F1), the first reflective surface having a curvature such that substantially all of the reflected light rays propagate at a first angle relative to an axis that passes through the point and converge towards a region to produce uniform illumination at the region as shown in Figure 2 and as described in the abstract.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alessandro V. Amari whose telephone number is (571)

Art Unit: 2872

272-2306. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on (571) 272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ava^{AM}
29 March 2006

Alessandro Amari
Alessandro Amari
Examiner AU2872